

What is claimed is:

*APM*

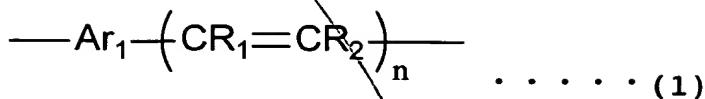
1. A polymeric fluorescent substance which emits a fluorescence in solid state and having a number-average molecular weight of  $10^3$  to  $10^8$  in terms of polystyrene, wherein the substance contains each one or more of repeating units represented by the following formula (1) and formula (3), respectively, and these repeating units are so selected as to satisfy the following conditions (a) to (c):

(a): the total amount of the repeating units represented by the formulae (1) and (3) is 50 mol% or more of the amount of the whole repeating units,

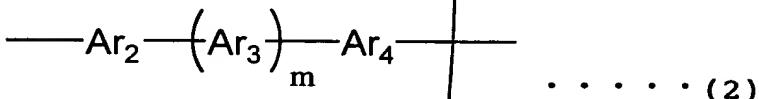
(b): the amount of the repeating unit represented by the formula (3) is more than 0.1 mol% and less than 9 mol% based on the total amount of the repeating units represented by the formula (1) and formula (3), and

(c): when the absorption edge wavelength of a polymer solely composed of a repeating unit represented by the formula (1) is represented by  $\lambda_1$  (nm) and the absorption edge wavelength of a polymer solely composed of a repeating unit represented by the formula (3) is represented by  $\lambda_2$  (nm), the following relation is satisfied:

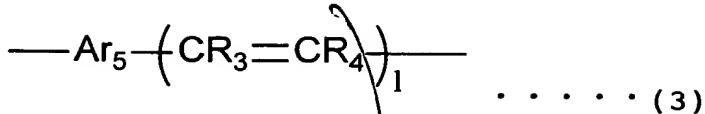
$$1239/\lambda_1 \geq 1239/\lambda_2 + 0.05$$



in the formula,  $\text{Ar}_1$  is a group represented by the following formula (2);  $\text{R}_1$  and  $\text{R}_2$  each independently represents a group selected from the group consisting of a hydrogen atom, alkyl group having 1 to 20 carbon atoms, aryl group having 6 to 60 carbon atoms, heterocyclic compound group having 4 to 60 carbon atoms and cyano group; and  $n$  is 0 or 1.



in the formula,  $\text{Ar}_2$  to  $\text{Ar}_4$  each independently represents an arylene group having 6 to 60 carbon atoms contained in the main chain, or a heterocyclic compound group having 4 to 60 carbon atoms contained in the main chain; at least one of  $\text{Ar}_2$  to  $\text{Ar}_4$  is a group other than a 6-membered ring, or at least one of  $\text{Ar}_2$  to  $\text{Ar}_4$  has a substituent other than a hydrogen atom; when a plurality of substituents are carried, they may be the same or different; adjacent rings may be mutually connected directly or via a substituent to form a ring;  $m$  is an integer from 0 to 3; wherein,  $\text{Ar}_2$  and  $\text{Ar}_4$  constitute a structure wherein if  $\text{Ar}_2$  moves in parallel to the polymer main chain, it does not completely overlap  $\text{Ar}_4$ .



in the formula,  $\text{Ar}_5$  represents an arylene group having 6 to 60 carbon atoms contained in the main chain, or a heterocyclic compound group having 4 to 60 carbon atoms contained in the main chain;  $\text{R}_3$  and  $\text{R}_4$  each independently represents a group selected from the group consisting of a hydrogen atom, alkyl group having 1 to 20 carbon atoms, aryl group having 6 to 60 carbon atoms, heterocyclic compound group having 4 to 60 carbon atoms and cyano group; 1 is 0 or 1.

2. A polymeric fluorescent substance which emits a fluorescence in solid state and having a number-average molecular weight of  $10^3$  to  $10^8$  in terms of polystyrene, wherein the substance contains each one or more of repeating units represented by the following formula (1), formula (3) and formula (4), respectively, and these repeating units are so selected as to satisfy the following conditions (d) to (f):

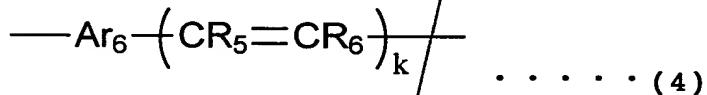
(d): the amount of the repeating unit represented by the formula (1) is 10 mol% or more of the amount of the whole repeating units, and the total amount of the repeating units represented by the formula (1), formula (3) and formula (4) is 50 mol% or more of the amount of the whole repeating units,

(e): the amount of the repeating unit represented by the formula (3) is more than 0.1 mol% and less than 9 mol% based on the total amount of the repeating units represented

by the formula (1), formula (3) and formula (4), and  
(f): when the absorption edge wavelength of a polymer  
solely composed of a repeating unit represented by the  
formula (1) is represented by  $\lambda_1$  (nm), the absorption edge  
wavelength of a polymer solely composed of a repeating unit  
represented by the formula (3) is represented by  $\lambda_2$  (nm) and  
the absorption edge wavelength of a polymer solely composed  
of a repeating unit represented by the formula (4) is  
represented by  $\lambda_3$  (nm), the following relations are  
satisfied:

$$1239/\lambda_1 \geq 1239/\lambda_2 + 0.05$$

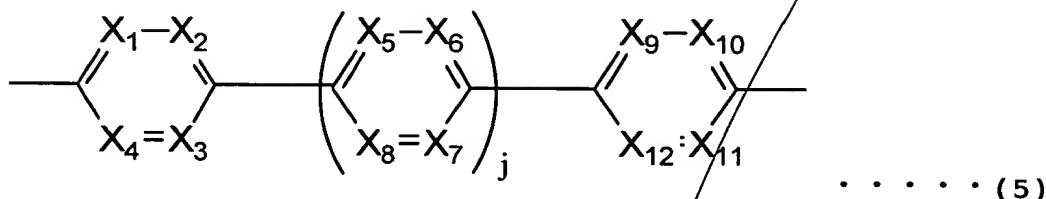
$$1239/\lambda_3 \geq 1239/\lambda_2 + 0.05$$



in the formula,  $\text{Ar}_6$  is an arylene group having 6 to 60 carbon  
atoms contained in the main chain, or a heterocyclic compound  
group having 4 to 60 carbon atoms contained in the main chain;  
 $\text{R}_5$  and  $\text{R}_6$  each independently represents a group selected from  
the group consisting of a hydrogen atom, alkyl group having  
1 to 20 carbon atoms, aryl group having 6 to 60 carbon atoms,  
heterocyclic compound group having 4 to 60 carbon atoms and  
cyano group; and  $k$  is 0 or 1.

3. The polymeric fluorescent substance according to  
Claim 1 wherein the group represented by said formula (2)

is a group represented by the following formula (5):



in the formula,  $X_1$  to  $X_{12}$  each independently represents C-R, or N, and at least one of  $X_1$  to  $X_{12}$  is C-R; wherein, R, represents a group selected from the group consisting of a hydrogen atom, alkyl group having 1 to 20 carbon atoms, alkoxy group having 1 to 20 carbon atoms, alkylthio group having 1 to 20 carbon atoms, alkylsilyl group having 1 to 60 carbon atoms, alkylamino group having 1 to 40 carbon atoms, aryl group having 6 to 60 carbon atoms, aryloxy group having 6 to 60 carbon atoms, arylalkyl group having 7 to 60 carbon atoms, arylalkoxy group having 7 to 60 carbon atoms, arylalkenyl group having 8 to 60 carbon atoms, arylalkynyl group having 8 to 60 carbon atoms, arylamino group having 6 to 60 carbon atoms, heterocyclic compound group having 4 to 60 carbon atoms and cyano group; at least one R, is a group other than a hydrogen atom; when a plurality of R, 's are present, they may be the same or different; the group represented by the formula (5) has at least one substituent other than a hydrogen atom, and when the group (5) has a plurality of substituents, they may be the same or different;

adjacent 6-membered rings may be mutually connected directly or via a substituent to form a ring;  $j$  is an integer from 0 to 3; wherein,  $X_1$  and  $X_9$ ,  $X_2$  and  $X_{10}$ ,  $X_3$  and  $X_{11}$ , and  $X_4$  and  $X_{12}$  are not respectively the same simultaneously, and  $X_1$  and  $X_{12}$ ,  $X_2$  and  $X_{11}$ ,  $X_3$  and  $X_{10}$ , and  $X_4$  and  $X_9$ , are not respectively the same simultaneously.

4. The polymeric fluorescent substance according to Claim 3 wherein  $j=0$  in said formula (5).

5. A polymer light emitting device comprising a pair of electrodes composed of an anode and a cathode at least one of which is transparent or semitransparent and at least one light emitting layer disposed between the electrodes, wherein the polymeric fluorescent substance of any of Claims 1 to 4 is contained in said light emitting layer.

6. The polymer light emitting device according to Claim 5 wherein a layer containing an conducting polymer is disposed at least between one electrode and the light emitting layer so that the layer containing an conducting polymer is adjacent to said electrode.

7. The polymer light emitting device according to Claim 5 wherein an insulation layer having a thickness of 2 nm or less is disposed at least between one electrode and the light emitting layer so that the insulation layer is adjacent to said electrode.

8. The polymer light emitting device according to any

of Claims 5 to 7 wherein a layer comprising an electron transporting compound is disposed between the cathode and the light emitting layer so that the layer comprising an electron transporting compound is adjacent to said light emitting layer.

9. The polymer light emitting device according to any of Claims 5 to 7 wherein a layer comprising a hole transporting compound is disposed between the anode and the light emitting layer so that the layer comprising a hole transporting compound is adjacent to said light emitting layer.

10. The polymer light emitting device according to any of Claims 5 to 7 wherein a layer comprising an electron transporting compound is disposed between the cathode and the light emitting layer so that the layer comprising an electron transporting compound is adjacent to said light emitting layer, and a layer comprising a hole transporting compound is disposed between the anode and the light emitting layer so that the layer comprising a hole transporting compound is adjacent to said light emitting layer.

11. A flat light source obtained by using the polymer light emitting device of any of Claims 5 to 10.

12. A segment display obtained by using the polymer light emitting device of any of Claims 5 to 10.

13. A dot matrix display obtained by using the polymer light emitting device of any of Claims 5 to 10.

14. A liquid crystal display obtained by using the polymer light emitting device of any of Claims 5 to 10 as a baek-light.

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